

CLAIMS

What is claimed is:

1. A method for enabling combustion-assisted engine starting, comprising:
 - adjusting a throttle valve to provide an air flow rate to an engine of a vehicle that is sufficient to create starting torque;
 - 5 injecting fuel that is sufficient to create said starting torque into a cylinder of said engine during an intake stroke of said cylinder;
 - disabling a spark plug of said cylinder;
 - disabling an intake and exhaust valve of said cylinder;
 - 10 and
 - deactivating said engine.
2. The method of Claim 1 further comprising:
 - enabling at least one additional cylinder of said engine for combustion-assisted starting before said deactivating step.
3. The method of Claim 1 wherein said throttle valve adjusts a Manifold Absolute Pressure (MAP) of an intake manifold in said engine.
4. The method of Claim 1 wherein an Electronic Throttle Control (ETC) adjusts said throttle valve.
5. The method of Claim 1 wherein said engine is one of a multi-port fuel injected spark-ignition engine and a direct-injection spark-ignition engine.

6. A method for activating an engine enabled for combustion-assisted starting, wherein intake and exhaust valves of one or more cylinders in said engine are deactivated and spark plugs of said one or more cylinders are disabled, comprising:

- 5 enabling said spark plugs; igniting a fuel/air charge that is sufficient to create starting torque in at least one of said one or more cylinders.

7. The method of Claim 6 wherein a piston of said at least one of said one or more cylinders is positioned between a Top Dead Center (TDC) position of a compression stroke and a Bottom Dead Center (BDC) position of an expansion stroke before said igniting step.

8. The method of Claim 6 wherein a piston of said at least one of said one or more cylinders is positioned between a TDC position of an exhaust stroke and a BDC position of an intake stroke before said igniting step.

9. The method of Claim 6 further comprising:
activating an intake and exhaust valve of said at least one of said one or more cylinders after said igniting step.

10. The method of Claim 6 wherein said engine is one of a multi-port fuel injected spark-ignition engine and a direct-injection spark-ignition engine.

11. The method of Claim 6 wherein fuel/air charges in two of four cylinders in a four cylinder engine, four of six cylinders in a six cylinder engine, four of eight cylinders in an eight cylinder engine, six of ten cylinders in a ten cylinder engine, six of twelve cylinders in a twelve cylinder engine, and ten of sixteen cylinders in a sixteen cylinder engine are ignited in said igniting step.

12. A combustion-assisted engine start/stop system, comprising:

- an Electronic Throttle Control (ETC) that adjusts a position of a throttle valve in a vehicle;
- 5 a fuel injection system that injects fuel into a plurality of cylinders of an engine based on said position;
- an ignition system that is capable of disabling a spark plug in at least one of said plurality of cylinders;
- a valvetrain system that is capable of disabling an intake and exhaust valve in said at least one of said plurality of cylinders; and
- 10 a controller that communicates with said ETC, said ignition system, and said valvetrain system, wherein combustion-assisted engine starting is enabled by containing a fuel/air charge sufficient for starting torque in said at least one of said plurality of cylinders when said spark plug and said intake and exhaust valve are disabled.
- 15

13. The combustion-assisted engine start/stop system of Claim 12 wherein all of said plurality of cylinders contain fuel/air charges sufficient for starting torque after a shutdown process of said engine.

14. The combustion-assisted engine start/stop system of Claim 12 wherein an activation process of said engine ignites contained fuel/air charges in two of four cylinders in a four cylinder engine, four of six cylinders in a six cylinder engine, four of eight
5 cylinders in an eight cylinder engine, six of ten cylinders in a ten cylinder engine, six of twelve cylinders in a twelve cylinder engine, and ten of sixteen cylinders in a sixteen cylinder engine.

15. The combustion-assisted engine start/stop system of Claim 12 wherein said position adjusts a Manifold Absolute Pressure (MAP) of said engine.

16. The combustion-assisted engine start/stop system of Claim 12 wherein said engine is one of a multi-port fuel injected spark-ignition engine and a direct-injection spark-ignition engine.